

5.9 GHZ BAND: MYTHS vs. FACTS

Vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), and vehicle-to-pedestrian (V2P) technologies, collectively known as **vehicle-to-everything (V2X) technologies**, allow vehicles to communicate with other vehicles, infrastructure, and pedestrians/bicyclists to prevent traffic crashes. V2X technologies provide drivers with safety alerts so that drivers can take action to avoid a crash or reduce the severity of injuries or damage to vehicles and infrastructure. Annually, more than 36,000 people are killed and more than two million people are injured due to motor vehicle crashes; the economic cost of these crashes is more than \$800 billion per year.¹ By providing drivers with basic safety messages at 10 times a second, NHTSA estimates that V2X technologies could reduce the number and severity of unimpaired motor vehicle crashes by up to 80%.²

V2X technologies need dedicated spectrum to ensure uninterrupted high-speed communication. For V2X communications to work safely, the messages must travel fast and without interference. The Federal Communications Commission (FCC) has proposed to give away the majority of the spectrum dedicated to transportation safety for exclusive use by unlicensed devices, such as Wi-Fi (the proposal would reallocate 45 MHz of the 75 MHz in the 5.9 GHz band). Research released by the U.S. Department of Transportation (USDOT) indicates that the spectrum arrangement proposed by the FCC will cause significant interference between unlicensed devices and the remaining V2X channels, threatening the reliability of the entire V2X band.

Throughout the debate over spectrum policy for the 5.9 GHz band, supporters of the FCC's proposal have made inaccurate or misleading claims. This document will offer evidence which addresses the most common of these claims.

Myth: We don't need to choose between auto safety and better wireless broadband in the 5.9 GHz band – we can have both.

FACT:

While the FCC and the cable industry claim that auto safety will not be undermined by this rulemaking, evidence provided by transportation safety experts such as USDOT is not considered. That research states that “[w]ith the limitation of a 30 MHz allocation, we note that neither of the two technologies in discussion—Dedicated Short-Range Communications (DSRC) or 4G long-term evolution cellular V2X communications (LTE-CV2X)—may be able to effectively use the 30 MHz allocation, nor can their operations be accommodated together in the band.”³ Secretary of Transportation Elaine Chao wrote that the FCC plan “jeopardizes the significant transportation safety benefits that the allocation of this Band was meant to foster.”⁴ The allocation of 75 MHz was made based on a national planning effort and designed to provide a platform for the development of a safer transportation network throughout the United States. Standards have been developed, investments made, plans developed, and equipment designed, tested, and deployed all based on utilizing 75 MHz of bandwidth.

Internationally, many countries have allocated significant spectrum from the 5.9 GHz band for V2X communications, including Canada (75 MHz), Mexico (75 MHz), Australia (70 MHz), Korea (70 MHz), and Singapore (50 MHz).⁵ In the European Union, 30 MHz of the 5.9 GHz band has been dedicated for transportation safety communications, and the Electronic Communications Committee has proposed extending this to 50 MHz while also providing an additional 20 MHz for non-safety applications.⁶ Japan currently dedicates 10 MHz of spectrum exclusively for transportation safety communications and 80 MHz for electronic toll collection, though there is testing to explore including additional V2X technologies in this 80 MHz band.⁷ In October 2018, China allocated 20 MHz of the 5.9 GHz band for the deployment of C-V2X technology.⁸

It is simply false to suggest that the 30 MHz allocation will provide a safer environment for the travelling public. In fact, initial USDOT testing indicates that the 30 MHz may be unusable for V2X because of interference from the use of unlicensed devices in the lower 45 MHz.

Myth: 30 MHz will provide ample spectrum for safety applications.

FACT:

V2X applications designed to use 70 MHz of spectrum cannot be compressed to operate in only 30 MHz. A report by USDOT anticipates that this cut in available spectrum would result in the loss of V2X applications, including:⁹

- Loss of life-saving vehicle safety applications – crash avoidance, vehicle-to-pedestrian applications (at a time when bicycle and pedestrian fatalities are increasing), coordinated intersection movement, and others.
- An expected end to automated truck platooning at the point when private sector testing is ready to commercialize truck platooning.
- Loss of broad and significant safety and mobility benefits including system efficiency through vehicle-to-infrastructure communications, road weather notices, transit and freight logistics, and public safety applications.
- A curtailing of new connected automation applications, just when these and other important innovations – edge-computing, machine-to-machine, and artificial intelligence – are emerging.

Myth: The FCC is proposing to increase the allocation for auto safety from 20 MHz to 30 MHz.¹⁰

FACT:

All 70 MHz are allocated and are being used for safety purposes, and the FCC's own rules state that safety communications have priority access over all other communications within the 70 MHz.¹¹ All 70 MHz is currently available for carrying basic and advanced safety communications – the proposal would decrease that allocation, not increase it. SAE International has published an industry-consensus standard (SAE J2945) with a channel-usage plan that uses all 70 MHz for safety applications.¹² The FCC proposal would reduce the spectrum available for safety applications from 70 MHz to 30 MHz.

Myth: Automakers and safety groups are divided on the value of keeping this spectrum for V2X technologies.

FACT:

The view that this reduction in spectrum available for safety purposes will somehow benefit automotive safety is rejected by USDOT, every state DOT, road safety groups, and public safety groups.¹³ While several automakers have voiced support for the NPRM's inclusion of C-V2X technologies in the 5.9 GHz band, and Ford has announced it will deploy C-V2X in the U.S. across all its models beginning in 2022, the transportation industry, including automakers, opposes the proposal's plan to give away a majority (45 MHz) of the spectrum. When it comes to saving lives on U.S. roads, the FCC should listen to the safety experts – including USDOT.

Myth: V2X is a failed automotive technology and has not progressed in 20 years.

FACT:

To call V2X a “failed automotive technology” demonstrates a misunderstanding of the requirements of safety technologies and the regulatory uncertainty that the FCC has fostered around this issue. When Wi-Fi devices malfunction, video does not load properly; when a safety device malfunctions, people can be killed. There is rightfully a different standard for the two technology types, and transportation safety experts have spent the time necessary to develop this technology to the point where V2X can meet those high standards.

Those in favor of giving away the spectrum also perpetuate a flawed timeline. While the 5.9 GHz band was allocated in 1999, the spectrum was not usable until service rules were adopted, licensing commenced, and a spectrum-sharing agreement with the incumbent satellite industry negotiated. This agreement was not reached until 2008.¹⁴ In the meantime, transportation safety experts worked with the National Highway Traffic Safety Administration to develop standards for these technologies that could allow the complex and instantaneous communications to function reliably every time.

Additionally, when the band environment and technology had advanced to the point where reliability could be assured, the cable industry and Wi-Fi advocates began aggressively seeking the use of the band for their businesses. Less than five years later, in 2013, the FCC opened a proceeding to examine the potential for band sharing between unlicensed devices (and the cable industry) and transportation uses. Even then, most of the V2X community indicated they would support band sharing if testing showed that sharing would cause no harm to safety. As automakers needed certainty that the requisite spectrum would remain available to justify investing in deploying V2X technologies within their vehicles, the FCC sent the exact opposite signals. A perfect example of this FCC-induced uncertainty is the letter from FCC Commissioners O’Rielly and Rosenworcel to Toyota North America in May 2018, shortly after the company announced in April 2018 that it would deploy V2X technologies in all its vehicles starting in 2021.¹⁵ Instead of supporting this development, the commissioners stated that they believed “it necessary to bring to your attention several factors that Toyota should keep in mind when committing capital expenditures to DSRC technology.” Namely, this letter suggested that the FCC could re-channelize the 5.9 GHz Band, prompting Toyota to withdraw its plans to deploy V2X. Now, the commission is pointing to a lack of deployment as a reason to claim that the 5.9 GHz spectrum is “laying fallow.”¹⁶

Myth: With the FCC's proposal, Wi-Fi and auto safety don't have to share the same channel, removing the technical hurdle that has caused so much delay.

FACT:

Auto safety advocates are not opposed to sharing the 5.9 GHz band with unlicensed devices if testing indicates that sharing would not interfere with the ability of V2X technologies to function. The FCC had committed to completing three phases of testing by January 2017 to ascertain the technical feasibility of a sharing arrangement but, as of January 2020, has yet to finish phases two and three.¹⁷ Chairman Ajit Pai declared that while the results of the first phase of testing showed “promise,” the Commission intends to move forward with its proposal to reallocate the majority of the spectrum prior to the completion of the testing to avoid “delays.”¹⁸ USDOT, in partnership with the FCC, is currently conducting testing under phase two. V2X proponents have continued to request that these three phases of testing be completed before the FCC decides to permanently give away the majority of the 5.9 GHz spectrum. It is the FCC's responsibility to complete the testing and determine if it is possible for the economic benefits of expanded spectrum for Wi-Fi to coexist with the societal benefits of keeping 75 MHz for transportation safety technology before advancing the proposal.

Myth: Without this FCC rulemaking the auto industry cannot deploy Cellular V2X (C-V2X) technology, so we must move ahead now.

FACT:

The FCC has argued that to allow C-V2X to operate in the band, it needs to move forward with this proposal, including reallocating 45 MHz of spectrum for unlicensed devices. However, the FCC can allow C-V2X in the 5.9 GHz band without reallocating a majority of the band for unlicensed devices. The FCC should amend the NPRM to remove its proposal giving away the majority of spectrum available for transportation safety. ITS America supports allowing the automotive industry to deploy C-V2X in the 75 MHz of spectrum located in the 5.9 GHz band.

Myth: The economic benefits of giving this spectrum to Wi-Fi outweigh the economic benefits of utilizing this spectrum for V2X technologies.

FACT:

The Commission relied on an economic analysis claiming that opening up the 5.9 GHz band to unlicensed devices would provide \$189.9 billion in benefits but failed to adequately consider the economic effects of retaining the 5.9 GHz band for transportation safety.¹⁹ While the Commission notes that the economic analysis did not estimate the potential loss of value from a reduction in

spectrum for V2X, USDOT has stated that there are \$800 billion in annual economic costs from the 37,000 lives lost, 2,746,000 injuries, and other quality of life factors that result from the more than six million police-reported crashes that take place on U.S. roadways each year, many of which could be prevented with lifesaving V2X technologies.²⁰ That figure also does not include the significant economic benefits of reducing traffic congestion, another benefit of V2X technologies, which costs the nation more than \$140 billion annually, according to USDOT.²¹ Additionally, the economic analysis the FCC relied on did not consider whether the value of reallocating the 5.9 GHz band to unlicensed devices would be reduced if other spectrum is provided for unlicensed devices; the FCC is currently in the process of releasing an additional 1200 MHz of spectrum in the 6 GHz band to unlicensed devices.

Myth: The value of investment already spent on V2X technologies is negligible.

FACT:

Hundreds of millions of taxpayer and private dollars have been invested in the development and deployment of this technology, the majority of which would be stranded if the 5.9 GHz spectrum is taken away.

Myth: V2X technologies are not necessary for autonomous vehicles. Other technologies, such as sensors, have eliminated the need for V2X technologies.

FACT:

V2X technologies enable applications that cannot be performed by un-connected automated vehicles, such as communicating with vehicles that are out of line-of-sight, providing road hazard warnings from roadside infrastructure, and allowing automated vehicles to coordinate actions rather than making decisions individually.²² V2X complements sensors by providing information that is more precise, over longer ranges, and in non-line-of-sight conditions.

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